Testing in the Context of the Operational Mission

4 March 2003

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Mike Toole

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Future Focus of DT and OT

- **Mission**
  - **Emphasis on fighting in Joint Network Centric Operations**

- **“Need to Test Systems in the Context of the Operational Mission”**
  - » **Dr Marion Williams, AFTEC, Technical Director, ITEA Nov 2000**
- **Contracting**
  - **Lead Systems Integrator**
    - **Army Future Combat Systems**
    - **Global Missile Defense**

- **Combined Contractor & Government Test Teams in DT**

- **Distributed Integration & Test**
  - **OSD joint Distributed Engineering Plant (JDEP)**
  - **Air Force Joint Virtual Battle Space**
  - **Navy Distributed Engineering Plant (DEP)**
  - **Army Joint Interoperability Test Bed**
  - **MDA Theater Missile Defense Systems Exerciser (TMDSE)**
  - **Global Missile Defense Test Bed with ET (Embedded Test & Training)**
  - **Army Future Combat Systems System of Systems Integration Lab**

- **Leverage DT Developed Capability to Support OT**

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Testing for Joint Network Centric Operations

- **Systems and System of Systems Tested in the Context of the operational Mission**
  - **System Verification**
  - **Family of Systems Verification**
  - **Validate the Family of Systems Performance in a SoS Environment to include Joint operations.**

- **Integration Phase Approach**
  - **Concurrent System and System of Systems Level Testing**
  - **Reduces Risk of Systems of Systems Integration & Interoperability**
  - **Integration in mission context with simulations, emulations and prototypes**

- **Distributed Integration & Testing**
  - **Implement Simulation & Modeling Acquisition, Requirements & Training (SMART)**
    - **Instantiate the Family of Systems in the System of Systems Environment**
    - **Check out Interfaces and Design with real time simulations**
    - **Connectivity to Distributed System Integration Labs**
    - **Integrate early emulations to further reduce risk of prototypes interoperability in the mission context**
    - **Leverage the DT developed capability to Support OT**

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Potential Opportunity

- **OSD has goal to establish a Distributed Integration & Test and Experimentation Capability**
  - **to Support Experimentation to Development of Joint O&O and Doctrine**
  - **to Allow new programs to be integrated and tested as part of the Joint Force in the Network Centric Environment.**
- **Leverage Experience in Distributed Integration & Test and SMART to Meet the OSD Need**
  - **Integrated Contractor & Government Testing in DT**
  - **Leverage DT Capability to Support OT under Government control**
- **Common Hardware and Software Architecture**
- **Common Network**
  - **DREN**
  - **DISNET-LES**
- **Common Standards**
  - **HLA**
  - **JTA**
  - **TENA**

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Leverage SMART Experience
FCS SoS Virtual Framework Concept

Common Standards & Software Architecture

- Immerse System of Systems (SoS) into a realistic synthetic battlespace
- Provide End-to-End, Real-time, UoA-scale test capability as the SoS matures into a delivered product
- Provide distributed testing capability in System SILs, the SoSIL, and ranges
- Support validation of SoS models and simulations
- Verify SoS Spec requirements
- Provide interoperability testing with external systems

The SoS Virtual Framework wraps a simulated world around each Test Article, allowing for SoS performance assessment as the Test Articles mature.

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Control Node Architecture
Common Hardware Architecture

FUTURE COMBAT SYSTEMS
FCS
One Team – The Army/DARPA/Industry

SVF, Test Article Simulation, and Data Collection Platform (Qty 1)

- 32 Processor Server
- 5 TB Disk Farm
- Control & Monitoring Suite (Qty 3)
- COTS Software

Red and Blue Cell Equipment Suites

- Red Force Role Player Workstations (Qty 15*)
- Blue Force Role Player Workstations (Qty 15*)
- Crew Simulators / WMI Mock-Ups (Qty 16*)

*Qty is Scenario Dependent

Node Communications & Time Sync Suite

- 6506 Switch (Gb/100/10)
- TACLANE E-100 Encryptors
- Time Code IRIG B, IRIG A, 1PPS

Viewing Portal Suite (Sized for 20 Seat Theater)

- 2 Barco Projectors & Screen
- Audio & Video Processors
- Control Console & Recorders

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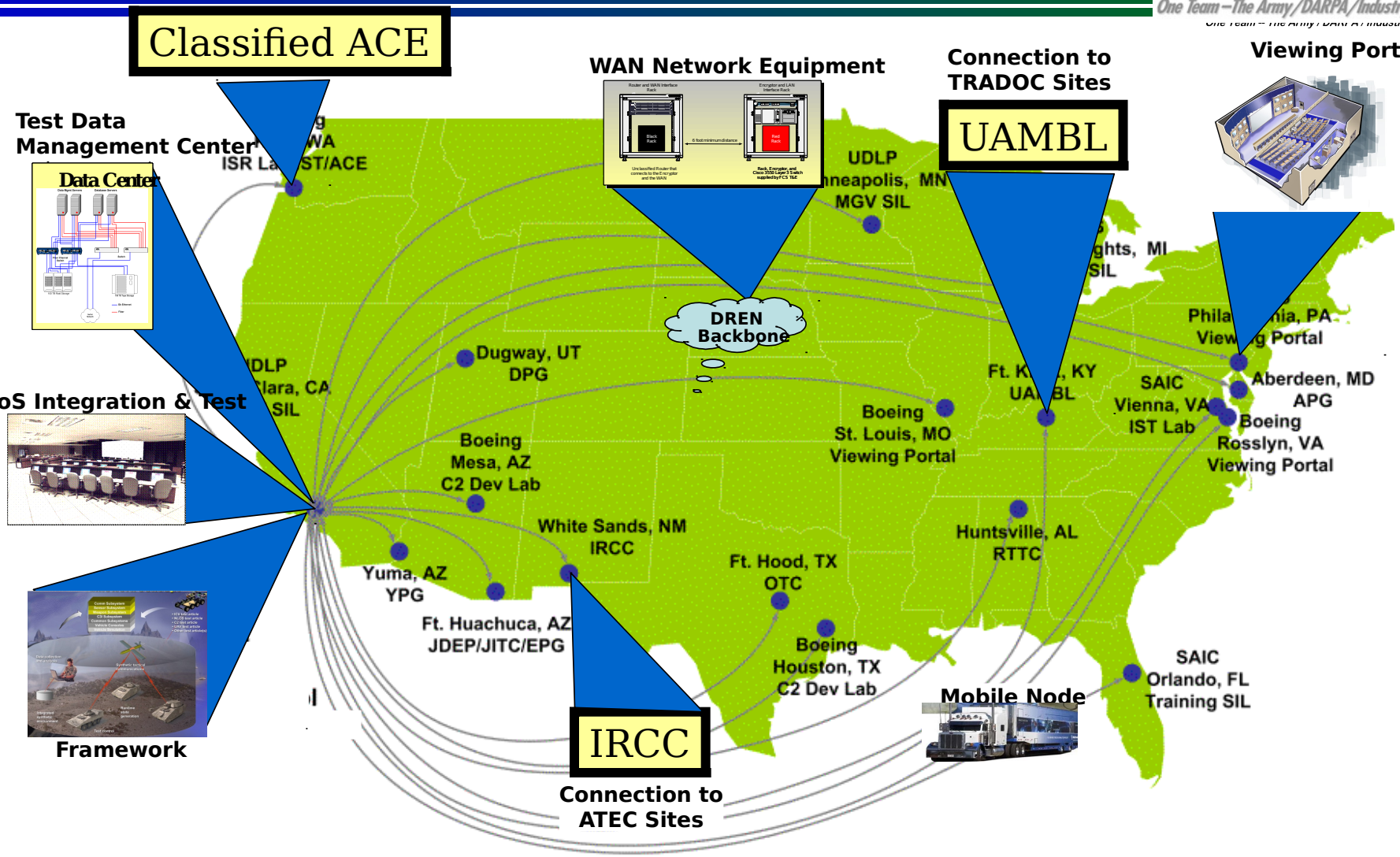
SoSIL – Nationwide Distributed FCS Test Environment



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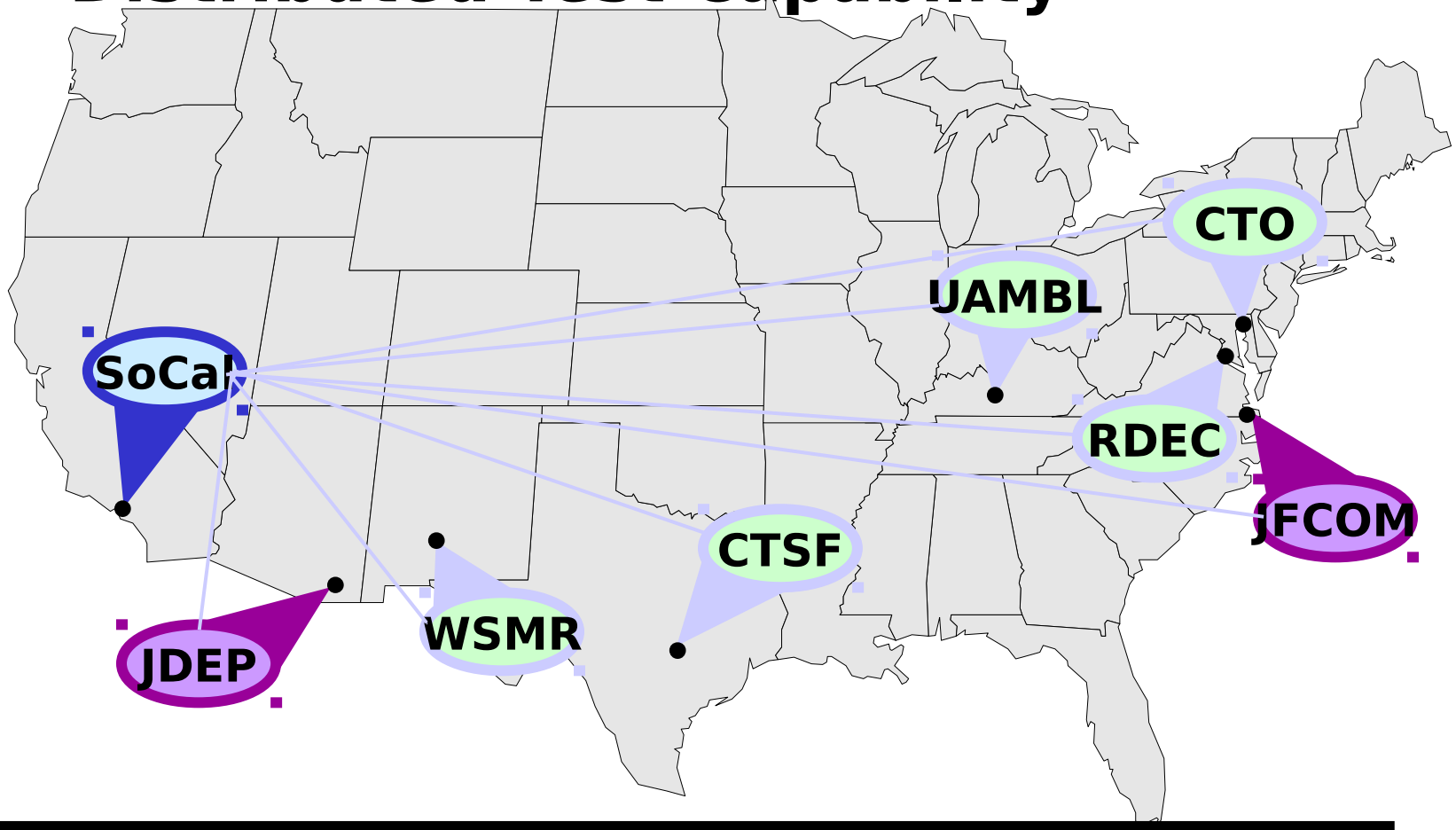
FCS-Focused, Nation-Wide Distributed Test Capability



Accessing Government Laboratory Resources To Support FCS Development and Test

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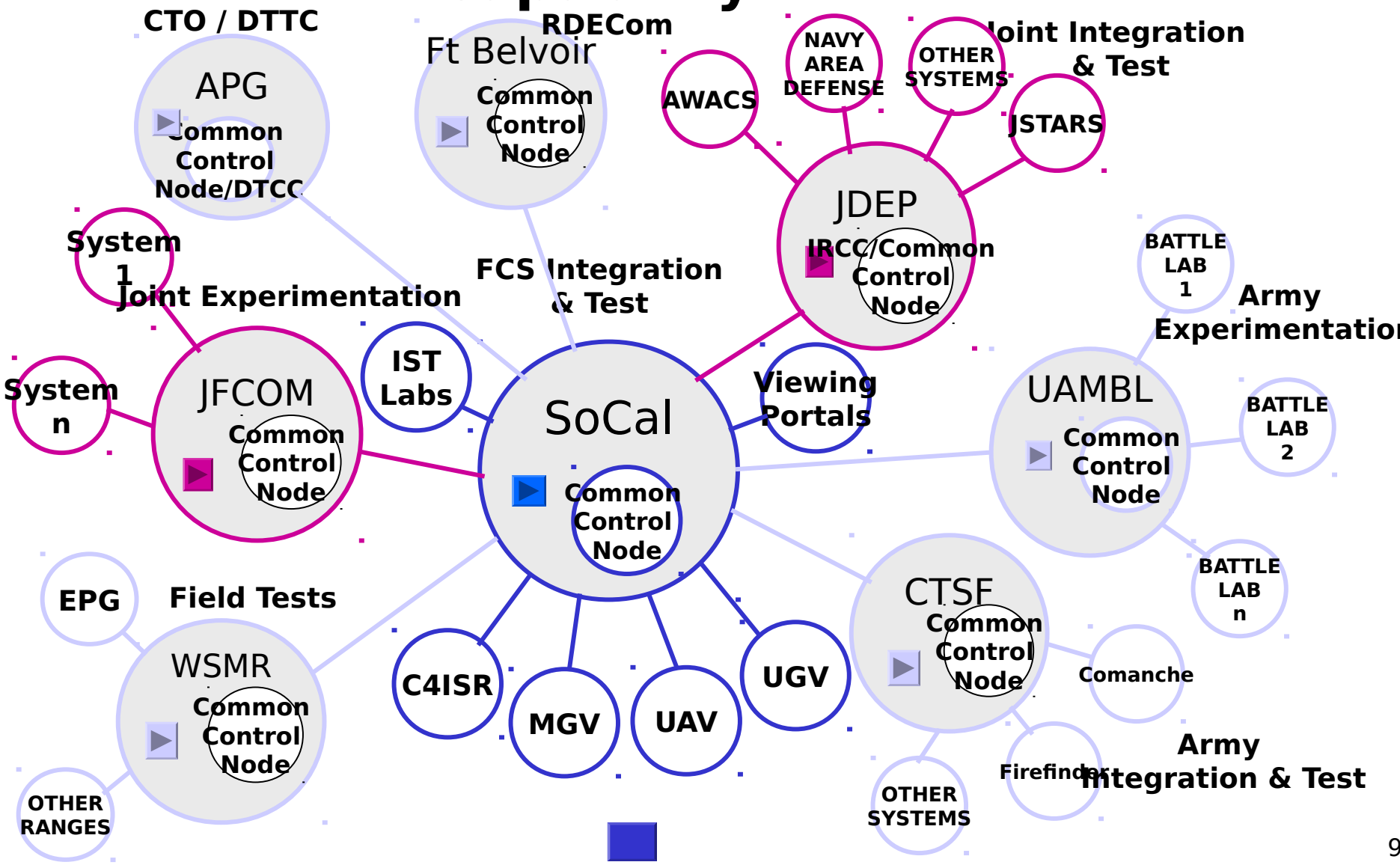
Distributed Integration & Test Capability



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